

## Affordable Vehicle Avionics (AVA)

Completed Technology Project (2013 - 2018)



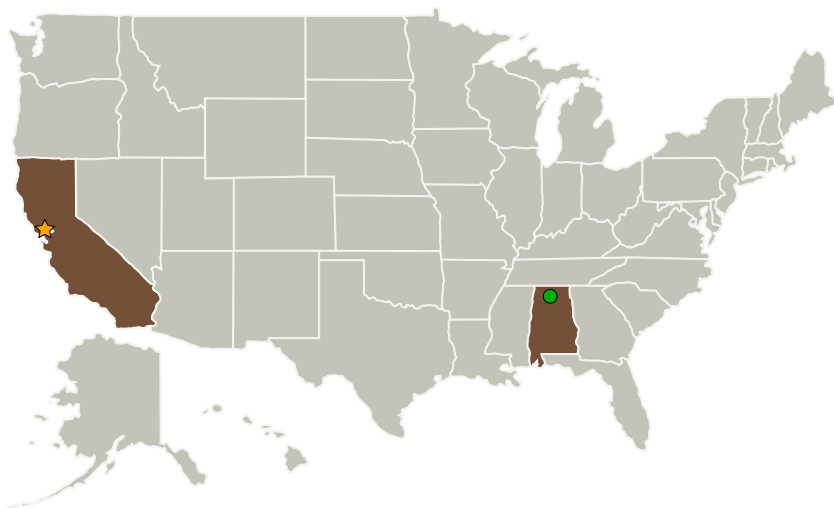
## Project Introduction

Public and private "nanolaunch" developers are reducing the cost of propulsion, but conventional high-performance, high-reliability avionics remain the disproportionately high cost driver for launch. AVA technology performs as well or better than conventional GNCs, but with a fraction of the recurring costs. AVA enables nanolaunch providers to offer affordable rides to LEO as primary payloads - meaning, nano-sat payloads can afford to specify their own launch and orbit parameters.

## Anticipated Benefits

AVA can reduce launch costs for small payloads and provide post separation attitude control for suborbital payloads. Provides a low cost avionics solution that can reduce the launch cost of small launch vehicles

## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
● Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama



Affordable Vehicle Avionics

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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Ames Research Center (ARC)

**Responsible Program:**

Game Changing Development

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## Primary U.S. Work Locations

Alabama

California

## Project Transitions

**October 2013:** Project Start**October 2018:** Closed out

**Closeout Summary:** Advanced Vehicle Avionics (AVA) targeted the development of a low cost, small platform avionics system that would provide nano-launch providers a viable and economic solution to flight guidance, navigation, and control. The AVA technology enables commercial small payload launch providers to reduce the cost of delivering payloads to Low Earth Orbit on a trajectory and schedule that is optimized to their needs. The project built three flight units which have successfully passed flight certification requirements for environment and acceptance testing. In September 2018 one of the units flew on SL-11, and another unit was flown as part of the ADEPT project on SL-12. The SL-11 flight demonstrated AVA successfully achieved primary flight-test objective for roll-axis closed loop control. Data synchronization challenges prevented AVA from achieving the secondary flight objective for three-axis attitude control. The AVA project was transferred to the Flight Opportunities Program (FOP) under the Announcement of Collaborative Opportunity (ACO) with UP Aerospace which will focus on control of the UP Aerospace "Spyder" orbital launch vehicle.

## Project Website:

[https://www.nasa.gov/directorates/spacetech/game\\_changing\\_development/in](https://www.nasa.gov/directorates/spacetech/game_changing_development/in)

## Project Management

**Program Director:**

Mary J Werkheiser

**Program Manager:**

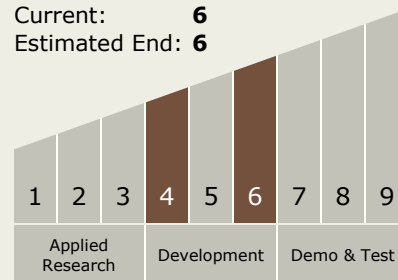
Gary F Meyering

**Principal Investigator:**

Amela Zanicic

## Technology Maturity (TRL)

Start: 4  
Current: 6  
Estimated End: 6

Target Destination  
Earth